Foundry Sand Stakeholders Meeting
December 1, 2005
Philadelphia, PA

MEETING NOTES

About the notes: During the facilitated discussion portion of each session, suggested action items were recorded on flip charts. These ideas for further action are underlined in the notes below.

At the end of the day, these action items were consolidated and voted on by the attendees. The consolidated action items, and the people who volunteered to lead the efforts, are listed below each session. The order of these items reflects the support they received during voting (i.e., top items received the most support by attendees). All action items are listed because many interested and experienced parties could not attend the meeting and provide their input.

EPA is interested in additional comments and suggestions regarding next steps. Please contact Robert Burchard at burchard.robert@epa.gov or 703-308-8450 with comments, or if you are interested in participating in these efforts. Presentation materials are available at: www.foundryrecycling.org

Disclaimer: The information and opinions contained in this meeting summary represent the professional opinions of the participants. This information has not received formal EPA peer review and does not necessarily reflect the views of EPA, or other participating organizations, and no official endorsement should be inferred.

Opening Remarks

Maria Vickers, Deputy Director, Office of Solid Waste, US EPA, and **Wayne Naylor**, Deputy Director, Waste and Chemical Management Division, US EPA Region 3, provided a welcome and an overview of the meeting objectives.

Kathleen Brady, ERG, Facilitator described ground rules and introduced the next session.

Foundry Sand Overview Session

Mike Lenahan, Resource Recovery Group, and **Dan Oman**, RMT Inc., provided an overview of foundry sands and identified issues associated with beneficial use.

Dr. Paul Tikalsky, Penn State University, **Dr. Robert Dungan**, Agricultural Research Service, USDA, and **Paul Koziar**, Beneficial Use Coordinator, Wisconsin Dept. of Natural Resources, provided an overview of the results of foundry sand characterization efforts.

Discussion

- Mike Lenahan and Dan Oman mentioned during their presentation that in terms of the distance between where the sand is generated and where the reuse activity will occur, there is generally a 25 mile limit to keep the reuse of foundry sand cost beneficial. When asked about this assumption, the presenters stated that this distance may depend on tipping fees. In addition, they stated that reuse activities get expensive whenever foundry sand is placed on trucks to be shipped to end-users.
- Dr. Paul Tikalsky mentioned during his presentation that he works with State DOTs to determine how foundry sands may be used in road projects. The three criteria that DOTs consider are:

  Is the foundry sand economic to use?
  Is the foundry sand environmentally benign?
  Is the foundry sand technically advantageous to use?

- Through his research, Dr. Tikalsky found that when beneficially reused, iron, aluminum, and steel foundry sands perform competitive to other materials. Develop Guidelines for FS Use
- Dr. Robert Dungan is conducting research to address horticultural and agricultural uses of foundry sand. He plans to compile a Beneficial Use Guidelines reference document for state regulatory agencies. When asked, Dr. Dungan explained that this document will result from his research, and he will seek outside stakeholder input on the Guidelines. Develop Guidelines for FS Use
- Most of the foundry sands in Wisconsin, 75-80 percent, are recycled. Industry or generators are required to track projects. Wisconsin DNR has never requested all of the data on the projects, because they do not have the resources to collect that volume of data. WI DNR would be delighted if an industry group or other organization could collect and compile the data. Collect and compile available industry and state data.
- The use of foundry sands in highway applications is not a cost or specifications issue. Rather it's an issue of the professional engineer choosing to use foundry sand and the contractor willing to take the risk of using foundry sands. Specifications for using foundry sands are available, and thus, not the issue. However, there is a lack of geotechnical engineering and design information on foundry sands. Regulators and generators should build a better relationship with geotechnical engineering associations such as the American Society of Civil Engineers (ASCE) and American Society of Foundation Engineering (ASFE). This can be done through submittals of studies to professional engineering journals. Dr. Benson of the University of Wisconsin is an editor of the ASFE journal.
- There is a need to develop a list of best management practices (BMPs) for handling materials coming out of foundries. There is also a need for a technical definition of the material itself. The American Foundry Society is already compiling BMPs.
- Just because foundry sands pass the TCLP does not mean that it is innocuous. Review Existing Test Methods and Models
- Potential processors do not know how to locate foundry sand sources nor do they understand foundry sand types, amounts, or quality control practices of foundry sands. Thus, there is a need to identify and distinguish materials that are approved for particular applications. A test system is needed that can tell if a foundry sand is okay to use or not. The focus should be to get a standardized test, accepted nationwide, that will determine or classify types of sand and appropriate applications. When determining appropriate applications, foundry sands should be compared to natural sands.
- Segregating different foundry sand streams is not necessarily a technical issue.
- Regulators need tools to make determinations on the use of foundry sands. The first step towards these tools would be to conduct a comprehensive risk assessment. The data is already available in research studies, but the problem is how to interpret the data. A change in the way we interpret the data is needed.
- Other US EPA programs have already developed screening levels for land application that might be applicable to foundry sands. There is a preliminary screening tool for brownfield soils characterization, which classifies when you need to take additional action. With a number under 30, no additional action is necessary. There is a lot of consensus behind the numbers used for the brownfields program. The group should look at some of the other regulatory programs to see what numbers they are using. Most states have lined up behind federal numbers because they do not need to justify the numbers.
- A private sector-university partnership, funded by the government, would furnish the hard data needed for implementation of a foundry sand program. The scientific perspective is critical to acceptance of foundry sands. We need to identify the existing research gaps, and thus, should not go forward with new research until we sort through existing data.
- There are regulatory differences between the states. States are at different places with review and acceptance of beneficial use of foundry sands. EPA Regional offices are needed to help coordinate foundry sand efforts and push for consistency among states.

Consolidation Action Items For Foundry Sand Characterization:

(1) Review existing testing methods, models, and specification and develop standardized process as needed (includes review of threshold numbers from existing programs). (NOTE: This Action Item received the third highest number of votes overall) Attendees who volunteered for this item: Jason Harrington, FHWA; Greg Helms, EPA/OSW; Hussain Bahia, UW-Madison; Jeff LeBlanc, WeCare Organics; David Iacono, EPA /Region 3; David Jones/EPA Region 9

NOTE: The next 3 consolidated Action Items received the same number of votes at the meeting

(2) Conduct a comprehensive risk assessment. Attendees who volunteered: Rufus Chaney, USDA/ARS; Rob Dungan, USDA/ARS; Nick Basta, OSU; Greg Helms, EPA/OSW; Lyn Luben, EPA/OSW

(3) Develop BMPs for foundries to follow to increase the marketability of their sands, develop definitions, certifications, training programs. Attendees who volunteered: Amy Blankenbiller, AFS; Jeff Kohn, EPA/OPEI

(4) Establish Regional Coordination among states. Attendees who volunteered: Robert Burchard, EPA/OSW; Susan Mooney, EPA/Region 5; ASTSWMO; Amy Blankenbiller, AFS

(5) Accumulate data from state BUD decisions and segregate according to use and type. Attendees who volunteered: Susan Mooney, EPA/Region 5; Robert Burchard, EPA/OSW; ASTSWMO

(6) Build Relationship with professional engineering and geotechnical associations. Attendees who volunteered: Dennis Grubb; David Iacono, EPA Region 3; Robert Burchard, EPA/OSW; Jason Harrington, FHWA; Jeff Kohn, EPA/OPEI; Elizabeth Olenbush, FIRST; Amy Blankenbiller, AFS

(7) Private sector-university partnership for research Attendees who volunteered: Dennis Grubb; Elizabeth Olenbush, FIRST

Construction Market Session

Mike Lenahan, Resource Recovery Group, and **Dr. Hussain Bahia**, University of Wisconsin, provided an overview of current uses, case studies, quality control needs, data gaps, outstanding technical, economic, and regulatory issues.

Discussion

- There has to be an economic cost savings for using foundry sands versus natural materials for users to consider using the materials. This savings depends highly on cost of natural sand. Pricing is sometimes done for foundry sand at 90 percent the cost of natural sand.
- There is a need for a fast, efficient, and universally accepted test for active clay in foundry sand. The methylene blue test can be used to detect clay and is easily done. While it is used at foundries, it is not generally accepted by the highway industry. Question that DOT asks is how blue is blue. FIRST working with DOTs to address the issue.
- Contractors are concerned over economics and liability issues. If a contractor proposes a substitute material that meets performance criteria and offers savings, the contractor and DOT get to split savings. WI DNR exempts foundry sands from liability issues in applications. In WI, public entities that use byproducts in accordance with WI DNR rules (NR 538) are exempt from liabilities. EPA's State Toolkit highlights this.

- ASTM has test for microwave drying of soils and sieving it. This could be amenable for DOT field application of fines. A review of existing test methods and models would be helpful.
- Transportation of foundry sand is the most limiting factor to its use because of its cost. A map of sources of material as well as users would be a great tool. Efforts need to be made to harness existing material supply network. The map should show the amount and locations, searchable by zip code, of sources of foundry sands. The material would have to be qualified to ensure validity of the material listed on the map. Both AFS and EPA are already working on mapping. The Portland Cement Association has prepared similar maps for cement plants.
- Contractors bid on projects a year before construction begins and then scout out materials. Foundry sand generators need to link up with the contactors at this time.
- Aggregate and stone companies do not stockpile foundry sands on-site due to the potential regulatory implications and permitting. Regulators need to understand that potential users do not want to be considered a solid waste facility, and thus, need a permit to store materials. WI DNR allows for storage for materials for up to 2 years for WI DNR Category 1 and 2 materials without a permit, as long as a specific project has been designated for the materials. It is important that foundries be allowed to consolidate their sands, since there are a large number of smaller generators.
- For aggregate, DOT certifies sources as allowable construction materials. This would be a good example to follow. AFS is investigating certification for materials by an independent third party. What are the incentives for facilities to go out and pay for certification? Composting Council has a certification program, STA, that could serve as a good model. NDOT has certification for source material, but no foundries have applied for certification primarily because of additional requirements.
- Lowes and Home Depot have hardscape products for outside use. Manufacturers of these products could use fly ash as cement replacement and foundry sand as replacement for natural sand. Kurtz Brothers has made these products, but it is not off the ground yet because of the economics.
- Grants could be established to foster brokers for foundry sands similar to the marketers for fly ash.
- Need to package the foundry sand as a product and make sure that it is easy to manage and fit into aggregate markets. This could be incorporated in the work being done on BMPs.
- STS consultants created marketing brochure for the material that included pictures of the material, listed properties, and noted projects and applications
- The moisture content makes foundry sands ideal to work with during the winter in northern climates. It is easier to bring this material up to moisture levels than to dry natural material. This can create a big economic advantage.

Consolidated Action Items For Construction Market:

(1) Generate map of foundries and potential end users (Note: this action received 2nd highest number of votes overall). Attendees who volunteered: Amy Blankenbiller, AFS; Robert Burchard, EPA/OSW; Andy O'Hare, PCA

(2) Network with National Aggregateand Stone associations. Attendees who volunteered: Elizabeth Olenbush, FIRST; Amy Blankenbiller, AFS; Jason Harrington, FHWA; UW-Madison

Soils Market Session

Bruce Bailey, Kurtz Bothers, and **Billie Lindsay**, The Ohio State University, provided an overview of current uses and case studies, quality control needs, data gaps, outstanding technical, economic, and regulatory issues.

Discussion

- 503 Clean Water Act designation for biosolids could be applied to foundry sands, but there are differences between biosolids and foundry sands. 503 could be used for a model, but not the specific numbers.
- Foundries do not seem to know enough about soil applications. They do not have a specialist to help find alternative applications for the material. Thus, foundries need training and education.
- Issues with commingling and blending the sands
- The market will take care of itself. If it is economical, businesses will do it. In other words, you will not need to market the product, demand will take care of itself as long as the economics are beneficial.
- To make regulators comfortable with approving the use of foundry sands, EPA needs to make a clear statement regarding health and environmental impacts of using foundry sands that there are no known health effects of using foundry sands.
- WI DNR has received requests for bagging and selling foundry sand at Home Depot. The difference between direct land application and bagging for residential application is that you do not know how the bagged product is going to be applied. Thus, there is a need to be able to apply rules/guidance/restrictions for use.
- The use of foundry sand as a bulking agent with biosolids has not been tried because of issues with porosity. Foundry sands are less contaminated than the biosolids. However, you are not allowed to dilute it under 503, so it has to be part of the process.
- A relationship should be built with the National Association of Home Builders (NAHB) and national landscaping associations. NAHB has been approached but has been non-responsive to this point. Can work with EPA's GreenScapes program.
- In Ohio foundry sands are not sold, but they create savings. The cost to foundry to process the sand to prepare for application is $3-4 per ton.
- Due to small quantity generation, foundries need to be able to consolidate to foster market. They have not been allowed to blend by state regulations.
- We know a lot about concentration but not so much about exposure. Thus, research on exposure assessments using existing models and test methods is needed to evaluate impacts. There is not a need to reinvent models. Other similar models could be used. Work should start with the worst case scenario.
- Objective, scientific criteria are needed on what is acceptable for use of foundry sands in soils.

Consolidated Action Items For Soils Market

(1) Develop guidelines, rules, and criteria for restricted/unrestricted use and address associated regulatory barriers. (NOTE: this Action Item received the most votes overall). Attendees who volunteered: Rufus Chaney, USDA/ARS; Rob Dungan, USDA/ARS; Nick Basta, OSU; Robert Burchard, EPA/OSW

(2) Develop clear statement about health and environmental impacts of use from EPA and/or state agencies. Attendees who volunteered: EPA/OSW

(3) Partner with national home building and landscaping associations and programs including AGC and Greenscapes. Attendees who volunteered: Amy Blankenbiller AFS

Other Markets Session

Elizabeth Olenbush, Foundry Industry Recycling Starts Today, provided an overview of other existing or potential markets.

Discussion

- The use of foundry sand is not allowed in all states. Some states have performance criteria for blends.
- Foundry sands can be used in a blend in plastic sock filled with compost to absorb phosphorus. Slag is also being tested as a great source of iron and could be a good absorbent for pollutants phosphorous and pesticides.
- Iron foundry slag can be used for arsenic removal from ground water.
- The volume of foundry sand that could be used should be considered when dealing with these alternative applications.
- A white paper is being developed on the use of foundry sand in a smelter in place of virgin sand. This paper will document the cost savings, virgin sands conserved, and the metals recovered from brass and bronze foundry sands.
- Subsidies for transportation of materials destined for beneficial use could be a way to foster the market.

Consolidated Action Items For Other Markets:

(1) Prepare a white paper on the use of certain foundry sands in smelters. Attendees who volunteered: Ricky Bryant, NIBCO; Robert Burchard, EPA/OSW

State Roundtable Session

Bob Doctor, Chair of ASTSWMO Beneficial Use Task Force, and other state officials explored with other stakeholders successes and remaining challenges for foundry sand beneficial use.

Jeff Kohn, U.S EPA, provided an overview of a draft toolkit and other regulatory information sources

Disclaimer: The following information are State descriptions of their regulatory programs and how they address beneficial use of materials such as foundry sand.

Discussion

Wyoming

- Does not have a formal beneficial use program. Beneficial use is considered on a case-by-case basis.
- Approved materials for beneficial use are essentially exempted from regulation.
- Environmental risk is the key factor.
- Unnecessary regulatory barriers need to be removed.
- A standardized sampling method is needed.
- People perceive foundry sand as a waste.
- We need to make sure it is safe to increase foundry sand use, possibly by establishing risk-based numbers.
- EPA's research on these issues would be helpful. States need to know that sand is safe and is going to perform like it should.

Kansas

- Kansas has several small foundries.
- Kansas is working with Kansas State University on agronomic uses.
- Kansas has worked in the past with Kansas State University to analyze BU requests.
- Kansas receives some beneficial use requests.
- Risk numbers are documented as standards for clean-up only, not for a "dirty down" approach.
- Concerned about cumulative risk, and evaluate it when there is more than one contaminant.
- Kansas hopes to put out technical guidance documents, and an approved list of uses, instead of issuing regulations.
- Kansas doesn't have a beneficial use program, but instead requests are submitted to the state for evaluation and approval.

Utah

- Utah doesn't have a formal beneficial use program.
- Rather, specific beneficial use must be proposed to the state. The state examines (1) whether the material is a hazardous waste, (2) if material is placed on the ground, it must meet residential (Superfund) numbers, and (3) if material is placed in a trench, industrial numbers must be met.
- Foundry sands are being landfilled in Utah. Foundries in Utah generate approximately 2.5 million tons of sand per year.

Illinois

- Illinois has voluntary state cleanup program numbers for residential and industrial areas.
- There's a number of monofills that could be tapped as a future resource.
- There's no formal state beneficial use program. Illinois EPA tried several times to get the state legislature to grant authority to establish a program.
- If foundry sand passes an extraction test for the drinking water threshold, it can be reused and is considered unregulated.
- Foundry sand is used as part of Illinois landfill cleanup program, to clean up/close abandoned landfills.
- Foundry sand is ideal for use in brownfields and in Greenways

North Dakota

- North Dakota has one or two foundries, which are struggling financially.
- State has tried to deal with the beneficial use issue over the years.

- Largest volume materials are coal combustion byproducts – power plants have agreements with marketers, and CCPs are used as soil stabilizers, filling mines, for flowable fill, grout, and cement.
- North Dakota has guidance available on CCPs for soil stabilization, reclaimed mines, and cement mixtures.
- The CCP guidance could be adapted for foundry sands.
- The CCP guidance adapts a modified ASTM leach method, at a 4:1 ratio.
- Spoke favorably about Wisconsin's rules.

Alabama

- CCPs aren't regulated.
- All foundry sands are exempt.
- Three landfills use foundry sand as alternate cover.
- Foundry sand is tested quarterly - if below 50% TCLP it is exempt, but you still can't dispose of it in a wetland or within five feet of a water body.

New Jersey

- No foundry sands are generated in the state.
- NJ's beneficial use program is similar to New York's and Pennsylvania's.
- Similar testing to matching cleanup criteria.
- NJ is receiving beneficial use applications.
- Ground water and subsurface vapor intrusion are examined as part of the applications.
- Consistent sampling and analytical data are compliance concerns.
- Increased use of foundry sand will come if you work with state environmental agencies up-front and early. It's important to treat wastes as a byproduct or co-product, other wastes must be kept out.
- There's an opportunity for foundry sand use with the expansion of the NJ Turnpike. They would welcome experimental projects

New York

- Has had a beneficial use program since the late 80's; companies have burden of proof.
- General Motors was issued the first BUD; others include bankrupt or redevelopment projects, daily cover, and fill.
- NY proposed residential and industrial use levels, with the intent to expand allowable reuses (currently in the comment period).
- Many of the foundries in NY have closed.
- Recent beneficial use determinations have been issued for clean-ups of sand piles.
- Beneficial use determinations are issued for local uses in asphalt and concrete.
- If something came up similar to the 503 biosolid sludge standard, that would help.
- There are 37 case-specific determinations on the NY website.

Indiana

- Indiana has a legitimate use program which categorizes uses, and materials in the categories are preapproved.
- Common uses are local fill, parking lots, and geotechnical use.
- State has 150 foundries, 30 have waste classifications or renewals.
- Partnering with local officials and foundries can be effective in promoting the beneficial use of sands.

Wisconsin

- Has a formal BU program that tracks where byproducts go (fs is regulated as a solid waste).
- Program establishes categories 1-5, for cleanest to dirtiest designations.
- Largely self-implementing.
- WI has 200 foundries, producing 9 million tons.
- WI points out that foundry sand is useful as daily cover.
- WI has a 90 percent reuse rate, and is aiming for 100 percent.
- They are updating their program to draw a clearer line between beneficial use and disposal.
- The largest problem is logistics surrounding transportation, management, processing, and blending

ASTSWMO Beneficial Use Taskforce will review the following concerns:

- Removing unnecessary regulatory barriers.
- Streamlining beneficial use determinations and programs (approval process).
- Developing consistent standards (interstate).
- Coordinating multi-media programs (states and EPA).
- Keeping the message simple.
- Educating the general public.
- Addressing funding challenges.

Review of Action Items and Commitments

Lillian Bagus, US EPA, reviewed action items and commitments (these are attached) from previous sessions and ensured that next steps were clear for all participants.

Next Steps

Establish committees to address action items and commitments
Committees develop strategies and timeframes for accomplishing action items

States in attendance:

Alabama
Georgia
Illinois
Indiana
Kansas
Minnesota
New Hampshire
New Jersey
New York
North Dakota
Pennsylvania
Utah
Virginia
Wisconsin
Wyoming